CHAPTER IV

A National Training Center Rotation — In Garrison

Introduction

Volume I of this study has described the fleshing-out of the NTC concept as the first sixty units rotated to the desert training center at Fort Irwin. We have detailed the experience of those battalion task forces as they executed force-on-force maneuvers and live-fire exercises over the rugged desert terrain of California's Mojave Desert.[1] The present chapter and the suceeding one expand on that earlier analysis and incorporate discussions of the major changes that occurred over the next ten years. During the period 1984-1993, some U.S. Army units experienced their first NTC rotation and others returned, hopefully to build on the experience of their first deployment to the NTC.

This chapter treats the experience of troops in garrison at Fort Irwin prior to their deployment to the field for fourteen days of the most realistic training available anywhere. It was in garrison within the confines of Forces Command's largest installation, that the groundwork was laid and that basic preparation for field exercises took place. Such preparation often went far in determining the successes and failures of a unit's missions in the field. It was there also that coordination—or the lack thereof—between combat, combat support, and combat service support elements and between rotating units and NTC permanent party personnel

1. Chapman, *NTC* Vol I, pp. 81-109. Despite original plans to conduct 28 rotations annually, those plans had to be abandoned as costs escalated and the new training center ironed out a myriad of "start-up" problems. In FY 1982, the NTC conducted 8 rotations (16 battalion task forces); in FY 1983, 10 rotations (20 task forces) were conducted; and in FY 1984, the NTC conducted 12 rotations (24 task forces). Ibid., pp. 53-54.

became crucial to the fortunes of the units that would face the NTC's superbly trained and experienced OPFOR.[2]

While most serious studies of the National Training Center have briefly acknowledged Fort Irwin's support to units undergoing rotations at the NTC, none have included details of that support. Previous studies have not examined the FORSCOM and TRADOC responsibilities, at Fort Irwin, to rotating units before the task forces left the relatively sheltered atmosphere of the garrison for two weeks in the field under combat conditions. While life in garrison certainly could not match the excitement of force-on-force maneuvers and live-fire exercises, units spent as much time during a typical rotation in garrison at Fort Irwin as they spent in the field. By 1993, the schedule for a 28-day rotation included 7 days devoted to equipment draw and other preparations, followed by a 14-day combat cycle during which the units were completely tactical. The final 7 days were devoted to equipment turn-in, maintenance, and preparations for return to home station.[3]

A rotation at Fort Irwin and the National Training Center was not a traditional or conventional field training exercise for U.S. Army battalion task forces. For many Forces Command units it meant as many as eighteen months of preparation. Exercise missions had to be chosen and scenarios written, in accordance with unit needs and functions. Individual weapons skills had to be honed, especially with regard to the use of the Multiple Integrated Laser Engagement System, or MILES.[4] Command and control (C^2) exercises were completed. Finally, equipment scheduled for shipment to the NTC was maintained or repaired and prepared for transportation. Meanwhile, advance parties from the rotating units visited the NTC to discuss the rotation with NTC officials and make whatever preparations were necessary. Members of the exercise observer/controllers visited each unit at home station to conduct the essential pre-training coordination, brief the rules of engagement, offer lessons learned,

---

2. The "opposing force," or OPFOR at the NTC is discussed in Chapman, *NTC*, Vol. I, pp. 85-90. Additional information is in Chapter V of this volume.

3. Most studies, articles, briefings, etc.—including this one—tended to use the terms "National Training Center" and "Fort Irwin" interchangeably. In the purest sense, they were not one and the same. As the facility's official name, "The National Training Center and Fort Irwin," implied, Fort Irwin was the Forces Command installation that supplied base operations support to the National Training Center. The NTC was a FORSCOM organization with a TRADOC element resident, the Operations Group.

The length of rotations had changed several times over the life of the NTC. In 1984 it had been set at 20 days. In May 1985, the NTC began 24-day rotation schedules which allowed for a four-day break to allow participating units to work on weaknesses discovered during the first half of the rotation (Ritenour, Appendix II-E-1; Report, ATZL-TAU-NP, 3 Apr 85, subj: National Training Center Executive Committee Meeting, 12 March 1991.). In 1991, 28-day rotations began.

4. A discussion of the MILES, the U.S. Army's most sophisticated tactical engagement simulation system, may be found in Chapman, *NTC*, Vol. I, pp. 68-71. The upgrades to that system are discussed in Chapter V.

and answer questions. Close coordination between NTC officials and the TRADOC NTC Operations group was essential.[5] For individual soldiers and officers, the prospect of spending approximately four weeks in the high desert of California often meant the adjustment of family arrangements. Commanders and their supply sergeants had carefully to calculate the nature and amount of supplies that had to accompany the unit to Fort Irwin, all of that with a recognition of Fort Irwin's rugged terrain and extreme climatic conditions. Transportation of troops to Fort Irwin—always from hundreds and often even thousands of miles away—had to be arranged.[6] Whatever the unit, preparation for a visit to the NTC meant a mixture of anticipation, excitement, anxiety, and, sometimes, dread.

The present chapter and the one that follows are not based on the experiences of any particular units or specific individuals or on the events of any one rotation. Rather, they reflect the collective experiences and events common to most units, soldiers, and commanders—BLUFOR and OPFOR—over a period of nearly ten years and expand on the previous account. Presented here are the additional details and the changes that occurred during the decade that followed the "go-no go" decision on the future of the NTC in late 1984.[7]

Fort Irwin

Since the training center's opening in 1982, troops had been flown to various military bases near the NTC—usually Norton, George, or March Air Force Bases—or to nearby commercial airports. The small airstrip at Fort Irwin was incapable of accommodating large transport aircraft. By 1993, all personnel from rotating units home-based too far from Fort Irwin to arrive by convoy, arrived at McCarren Airport, the commercial airport at Las Vegas, Nev. From Las Vegas, rotational troops were transported by bus to Fort Irwin,

---

5. The coordination between FORSCOM units scheduled for NTC rotations and NTC officials was discussed in *NTC* Vol.I, pp. 81-82. That process changed little over the next ten years, even with the introduction of rotations including special units such as cavalry and light infantry.

6. No units except the 40th Mechanized Infantry Division of the California National Guard were within 300 miles of Fort Irwin. The 7th Infantry Division at Fort Ord was the closest.

7. Information featured in this chapter was drawn from the author's direct observations and informal interviews with NTC officials; studies based on the direct observations of other observers; interviews with OPFOR and BLUFOR personnel conducted by the NTC Observation Division at the NTC; articles written by correspondents of official Army publications and a variety of commercial publications; and selected NTC briefings. All are cited individually below. In accordance with Department of the Army and NTC policy, designed to preserve the NTC's function as a place for units to train, make mistakes, and learn, performance data were not linked with specific units nor were rotation numbers identified.

at an average cost of $4,000 per unit.[8] Some equipment that did not require rail transportation was flown into El Toro Marine Corps Air Station, Calif. or Norton Air Force Base near San Bernardino, Calif.[9]

Fort Irwin, Calif., was located 130 miles northeast of Los Angeles and approximately the same distance west of Las Vegas, Nevada. The 650,000 acre (1,000 square miles) installation was roughly the size and shape of the state of Rhode Island and could lay claim to being the largest military training center of its kind in the world. (Map 4) As noted earlier, Fort Irwin, located in the high Mojave Desert of California, boasted some of the most rugged terrain in the continental United States and a mean elevation of 2,300 feet above sea level.[10] Located forty miles from Barstow, Calif., the nearest town, Fort Irwin was a relatively self-contained post. More than 3,700 active duty military personnel were assigned to the installation along with approximately 4,300 family members. The average tour of duty was three years. Fort Irwin also employed about 2,400 civilian personnel. Because of limited housing facilities on the installation, many permanent party personnel drove from Barstow to Fort Irwin every duty day. The only access was along Fort Irwin Road which joined Interstate Route 15 just north of Barstow. All along the narrow two-lane road were numerous white crosses, grim reminders of the number of commuters killed along the highway since the NTC had begun operations.

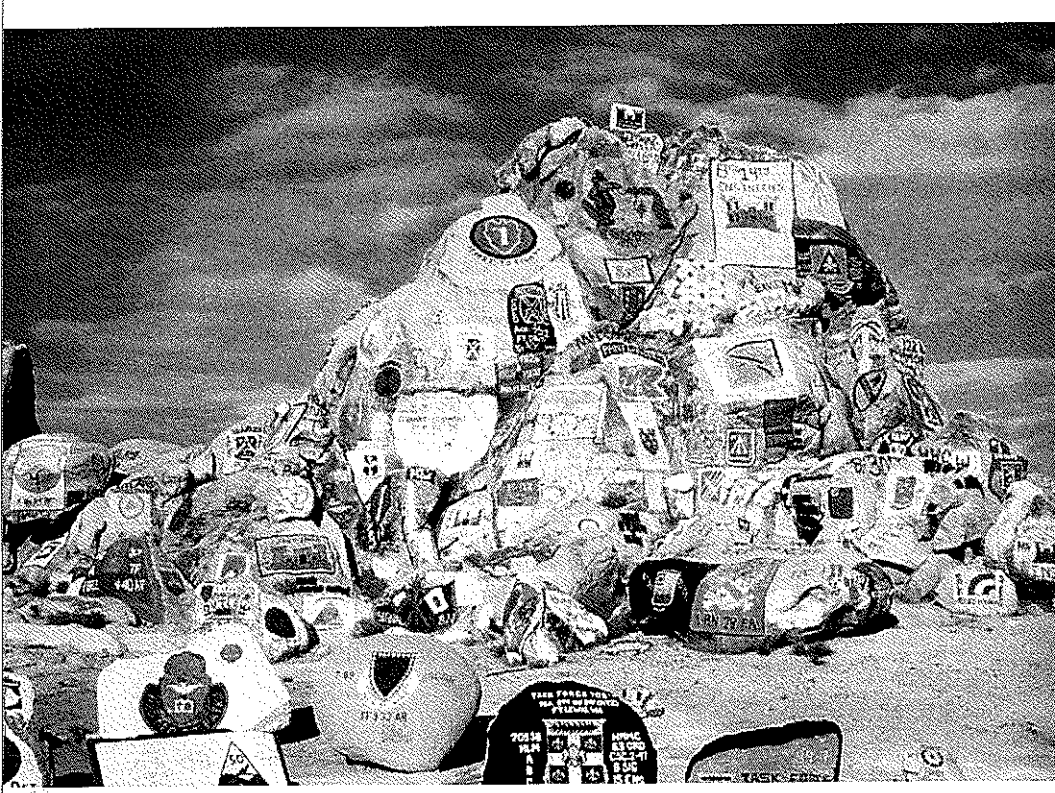
When the Army had reactivated the installation in 1981, its austerity was perhaps unrivaled among active military bases in the United States. Having been used only as a week-end training site for California National Guard units since 1972, half of the approximately 1,000 structures on the installation were temporary buildings of World War II vintage, and half of those were housing units. As one soldier unfortunate enough to arrive in 1981 put it: "[Fort Irwin] had a name, some run down motor pools, barracks, and houses." Over the next dozen years, a virtual transformation

---

8. Approximately 4,500 military personnel arrived at Fort Irwin for each rotation, for a total of roughly 55,000 per year. Specialist Galen Wiering, "A Diamond in the Rough: The National Training Center," *Army Research, Development, & Acquistion Bulletin*, Mar-Apr 1992, p. 18.

9. During 1993, the NTC and the Department of the Army began efforts to acquire the little-used Barstow-Daggett Airport which was located approximately thirty-five miles from Fort Irwin. "The Analysis of Alternative Study," required for purchase and completed in November 1993, concluded that of the alternatives to the existing arrangements, either the purchase of Daggett Airport or the possible acceptance of it as a gift from San Bernardino County, Calif., was the most cost effective approach. At that time, Military Construction-Army (MCA) estimates for the construction of a longer runway (Daggett's existing runway was only 6,500 feet in length) and of an adequate tower were an estimated $27 million. At the end of 1993, the issue remained unresolved. Briefing Slides, Combat Training Center Tasker Update, FORSCOM, CTC Quarterly Review 26 Oct 93.

10. See *NTC* Vol. I, pp. 25-32, for a detailed description of Fort Irwin, a brief history, and an account of the installation's choice as the site for the NTC.



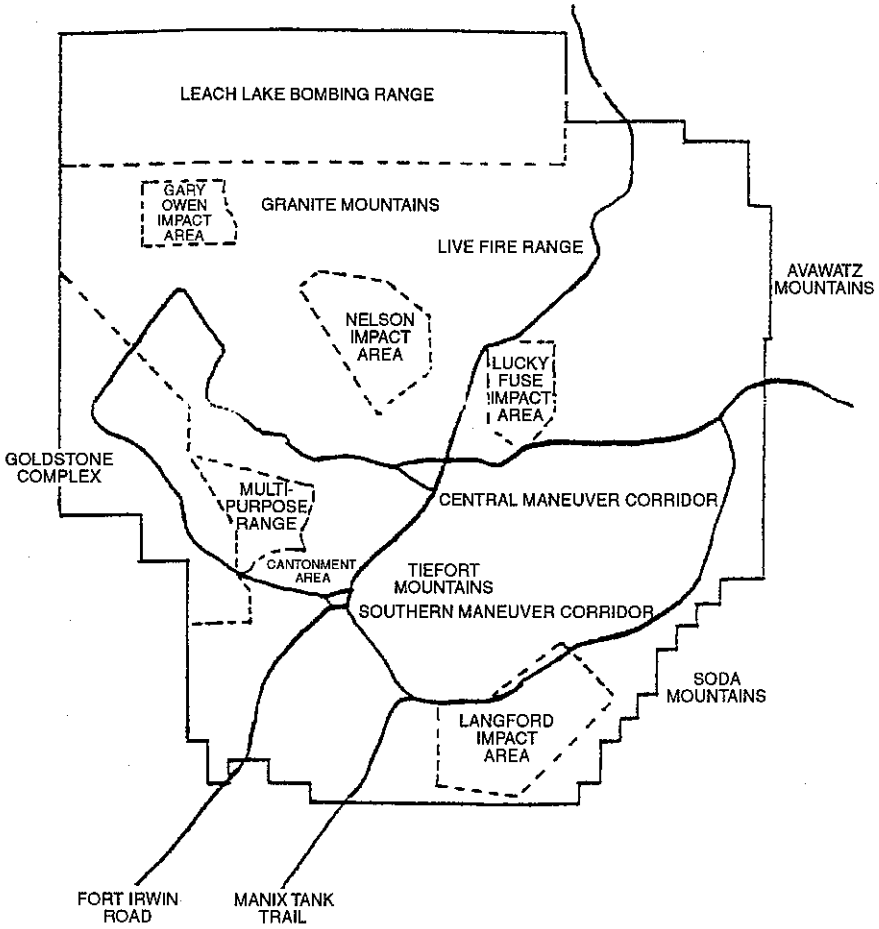
The "Painted Rocks" marked the entrance to Fort Irwin for rotating troops. Units had painted their crests and insignias on the rockpile since World War II.

took place. From 1981 to 1987, the Army spent some $236 million on building projects alone. The Fort Irwin of 1993 featured not only modern family quarters and troop barracks, VIP quarters, and dining facilities, but swimming pools, automobile crafts and fitness centers and many other recreational facilities, a library, elementary schools, a large new commissary and post exchange, a convenience store, and even a "fast food" restaurant. Since 1986, a contractor, DynCorp of Reston, Va., had provided base operations support to the Fort Irwin community. DynCorp employed more than 1,000 personnel, and a new five-year contract awarded in 1991 was valued at more than $195 million. Fort Irwin's average annual payroll was $117 million, and annual operating costs were approximately $50 million.[11]

---

11. (1) Sgt Dave Schad, "Home on the Range," *Soldiers*, June 1987, p. 42 (2) PR Newswire Association, Inc. 19 Sep 94. DynCorp Corps had previously been known as Dynaelectron Corporation. Until 1986, the functions performed by DynCorp had been the responsibility of Boeing Services International. See *NTC* Vol. I, pp. 83-84. (3) Financial figures are from NTC Visitor Book, Rotation 94-07, April 1994.

Map 4
Features of the U.S. Army National Training Center



Note: The four artillery impact areas shown here were cleaned up during 1985 and 1986 to provide more maneuver area.

Source: Enclosure to Ltr, United States Department of the Interior Fish and Wildlife Service, Southern California Field Station, to Brig. Gen. Wesley Clark, Cdr National Training Center, 24 Sep 1991.

Perhaps because of its desert setting, which was both harsh and spectacular, opinions about life at Fort Irwin varied as much as its terrain. In most Army circles—especially in the early days—duty there was not considered desirable, primarily because of the post's isolation. One soldier who had arrived at Fort Irwin while nature was still reclaiming what the Army had left behind, observed that he "noticed a lot of people retired right after they got here. They had orders for California and figured it would be beaches and fun-in-the-sun. Then they saw Fort Irwin." Another soldier, a member of the OPFOR, believed that "most Fort Irwin horror stories were started by soldiers that came to train." Those soldiers saw little of Fort Irwin—"once when their bus passes through on the way in and again on their way home."[12]

Other soldiers and their families assigned to Fort Irwin took a different perspective. Fort Irwin was only four hours or less from Las Vegas, Los Angeles, Disneyland, numerous ski resorts, state and national parks, forests, and recreation areas, and even Mexico. Others enjoyed the closeness that developed between family members, friends, and neighbors who shared a small and remote post, but who also shared the same mission—support to the National Training Center. Brig. Gen. Paul Funk, NTC commander from September 1988 to October 1989, perhaps put it best:

> It's hard for me to leave here. . . . The families of this installation are just terribly important to us and, in fact, I'll never forget many of the lessons that I've learned here. If I had to take one 14 month period of time in my life and compare this to any of the others in terms of what I learned, including by the way, I think in combat, I would say that this place has taught me more than any other place in any similar period of time.[13]

Fort Irwin was home to three groups of soldiers, which together totaled approximately 4,000. The commander, a brigadier general, and his staff provided the all-important planning as well as the "housekeeping" functions for both the garrison and the FORSCOM units that rotated to the NTC. That permanent force assigned to Fort Irwin ran everything from the post exchange to the housing facilities. An NTC Support Battalion, an

---

12. Schad, pp. 42-43. In the early days of the NTC, many soldiers assigned to Fort Irwin, arrived in California with orders to Fort Ord at Monterey. Fort Ord turned out to be only the last stop for soldiers on their way to Fort Irwin, because Fort Irwin had neither a finance office nor a personnel section.

13. Maj Jeff Marrin, NTC Operations Group, Observations Division, interview with Brig Gen Paul E. Funk, Fall 1989. Funk subsequently took command of the 3rd Armored Division in Germany.

element of the permanent party personnel, provided maintenance and upkeep for equipment prepositioned at Fort Irwin for use by rotating units.

A group of experienced senior trainers totaling approximately 640 soldiers served as training analysts and observer/controllers both in the field and at the TRADOC Operations Center on post. This "Ops Group," a TRADOC unit, was responsible for the MILES (Multiple Integrated Laser Engagement System) that allowed sophisticated force-on-force exercises and for the target array that created the large live-fire range. The third group, the 177th Armored Brigade/60th Guards Motorized Rifle Division of approximately 2,500 soldiers served as the opposing forces (OPFOR) during training exercises and made up the remainder of the military permanent party personnel. The 177th was the only combat unit stationed at Fort Irwin.[14]

In addition, Fort Irwin employed a number of federal government employees who supported such functions as public affairs, protocol, and public works, to name only a few. In a sense, Fort Irwin was unique among Army installations in that its response to visiting units changed monthly as rotating units redeployed to home station and other units arrived for training exercises. Adding significantly to the duties of Fort Irwin personnel was the necessity to support hundreds of visitors representing U.S. military and government personnel, foreign visitors both military and civilian, and contractors.[15]

Rotating units could not expect the amenities accorded other visitors to the NTC. From the beginning, the NTC concept had included only austere base operations support to rotating units. Army and NTC officials insisted that units be "stressed" under near realistic conditions from the moment of arrival. Rotating units were expected to live in the desert under conditions soldiers were expected to endure. Dining facilities, laundromats, air-conditioned buildings and other conveniences were off-limits to visiting troops.

Before deployment to the field, rotating units were required to set up camp in two-man tents in a bare bivouac area on Fort Irwin adjacent to the equipment draw yard and instrumentation initialization center known universally as the "Dust Bowl." There they often shared the blowing, choking dust with the coyotes who were constantly in evidence at Fort Irwin. In the training center's first years, there was nothing in the Dust Bowl to serve

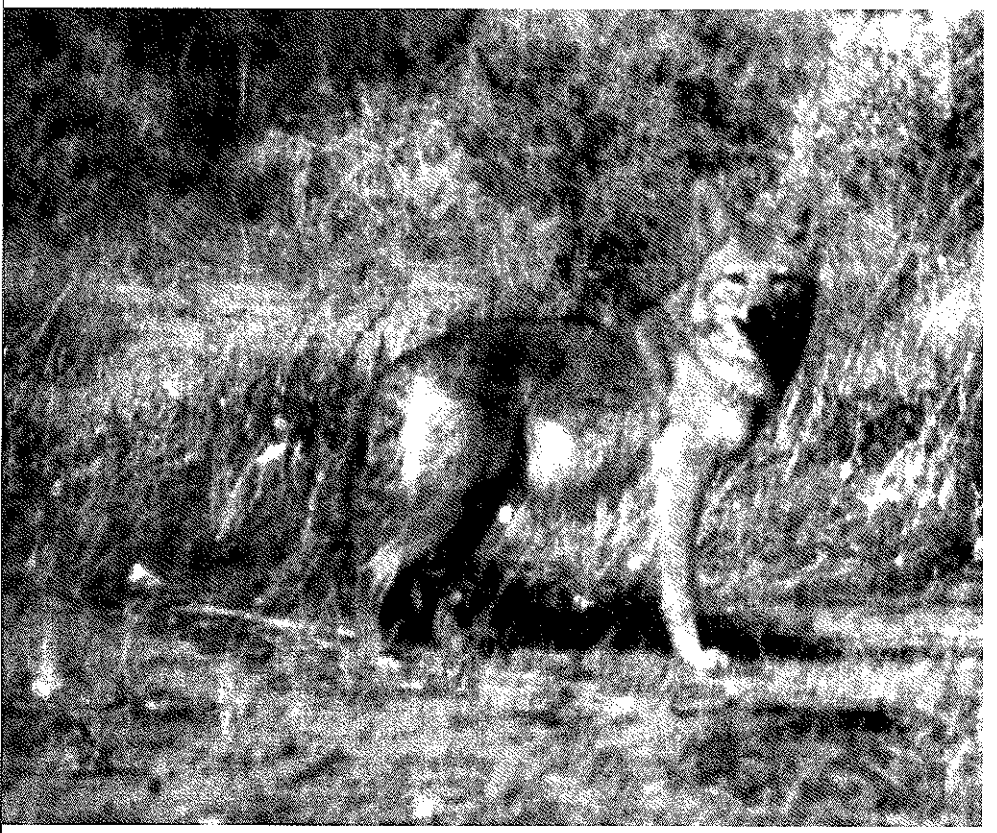
14. The MILES, the live-fire range, and the OPFOR are discussed in greater detail below. For the conversion of the 177th to the 11th Armored Cavalry Regiment, see Epilogue.

15. Col James P. O'Neal, *Defense News*, [1991].

as personnel support. By 1993, latrines and crude kitchens had been added. But as NTC commander Brig. Gen. William G. Carter III remarked, "the area is rough enough that none of them desire to stay there and they look forward to going out to the field." In short, units training at the NTC prepared for the field just as if they were actually deployed to a wartime combat situation. As a unit commander warned soldiers preparing for training exercises at the NTC, "There is no 'admin' at Fort Irwin . . . and your leaders . . . should feel like they are in a hostile fire zone from the time they get off the plane."[16]

A Bradley crewman from the 2d Armored Division sits atop his vehicle at the marshalling area called the "Dust Bowl."

16. Information on Fort Irwin is based on the author's observations and on conversations with NTC public affairs personnel. Quotation is from Lt. Col. Alan R. Cocks, "Objective NTC: Some Ideas for Leaders on How to Get There From Here," Student Essay, U.S. Army War College, Carlisle Barracks, Pa., 28 Feb 86, p. 9.

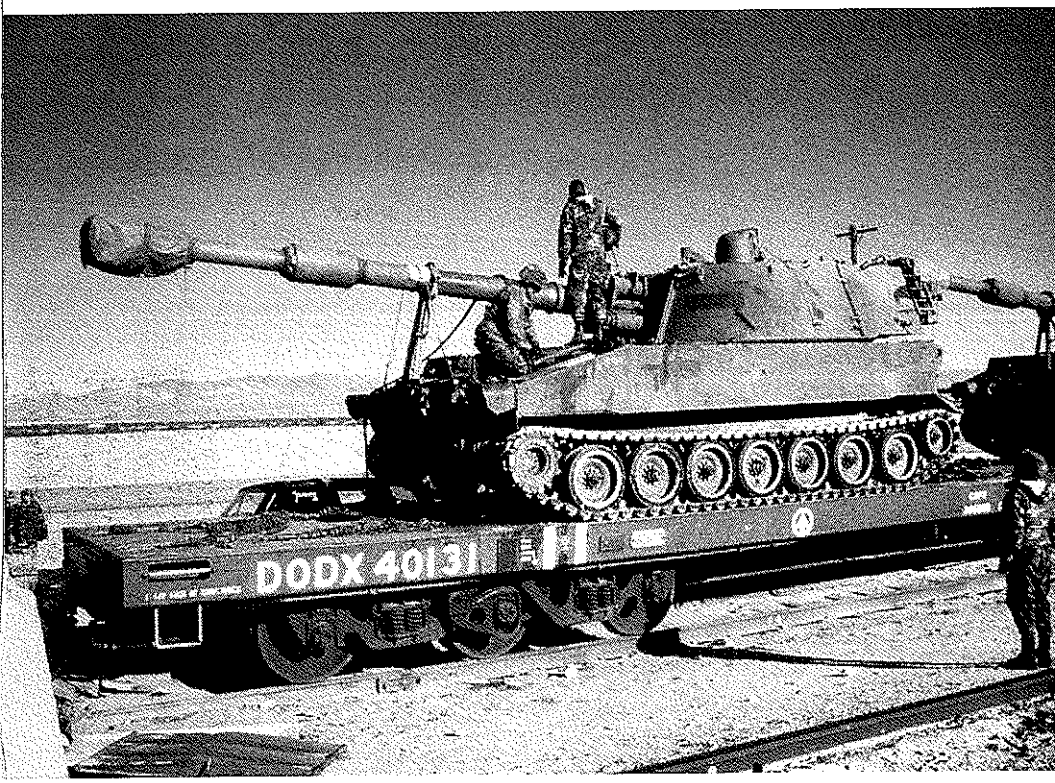


Rotating troops and visitors alike were often surprised at the large number of coyotes that made themselves at home on Fort Irwin.

The Question of Prepositioned Equipment

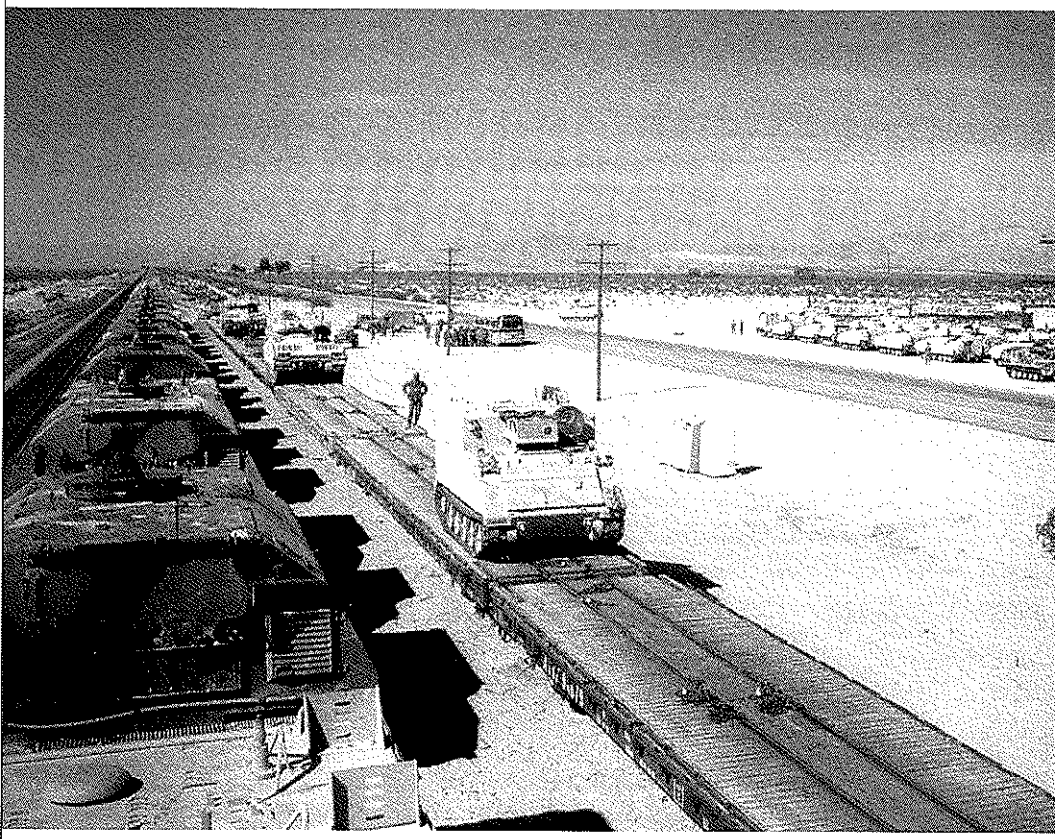
As unit personnel arrived either by air or convoy, their equipment brought from home station began to arrive by rail. Because the nearest railhead was near Barstow, thirty-seven miles away, the original NTC plans had included the construction of a railroad spur from Barstow to Fort Irwin. The railroad never received high priority for funding, and thus was never built. Meanwhile, beginning in the early to mid-1980s, most tracked vehicles were off-loaded from railroad cars at Manix railhead, approximately twenty miles east of Barstow, and driven across the desert to Fort Irwin via a 27-mile desert tank trail created from leased right-of-way. By 1993, the railroad siding at Manix was no longer in use by units bound for the NTC. Most tracked vehicles which arrived by rail were hauled by commercial conveyance from the U.S. Marine Corps Logistics

Base Yermo Annex north along the "Yermo cutoff" to Fort Irwin Road and northeast to Fort Irwin. During all of that period (1984-1993), wheeled vehicles were off-loaded at Yermo, driven to Manix, and thence to Fort Irwin by way of the dirt tank road. (Map 4) Most equipment arrived on single-deck railcars, approximately ninety feet in length. Transporting of equipment required an average of 370 railcars per rotation.[17]



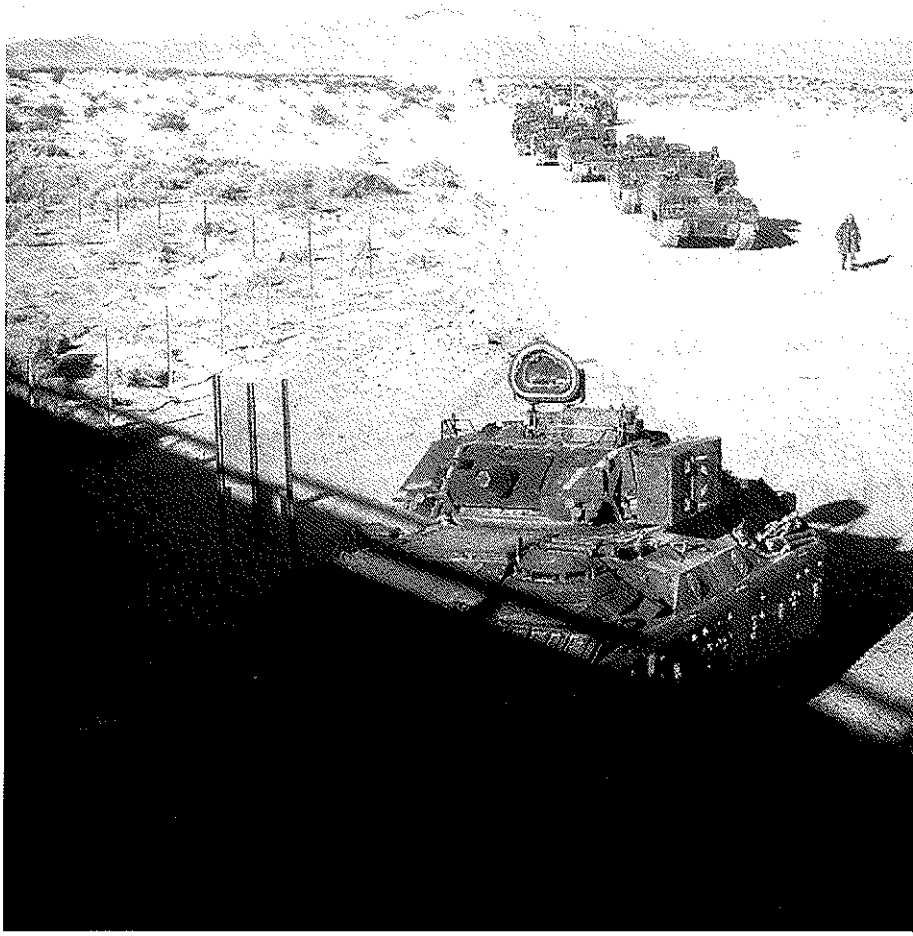
The unloading of a Task Force's equipment from rail cars took approximately two days to complete. From the railhead at Manix, the equipment was driven overland to Fort Irwin under the watchful eyes of the NTC Movement Control Center.

17. (1) FORSCOM Regulation 350-50, June 1991, p. 30. (2) Interviews with logistics personnel from various units with NTC experience. Most equipment was transported on single deck railcars, approximately 90 feet in length. The change in arrival locations and transport to Fort Irwin for tracked vehicles was perhaps influenced by at least one incident in which several Bradley Fighting Vehicles damaged the underpass on the tank road that passed under busy Interstate Route 15, temporarily causing the closing of the major route from Las Vegas to LosAngeles. The extremely narrow underpass at Manix had caused both FORSCOM and the California Department of Transportation (CalTran) to adopt stringent regulations for its use. For example, CalTran required that an NTC Movement Control Center Representative be present whenever vehicles transited the underpass. FORSCOM regulations required that all vehicles—one at a time— be ground-guided through at five miles per hour.



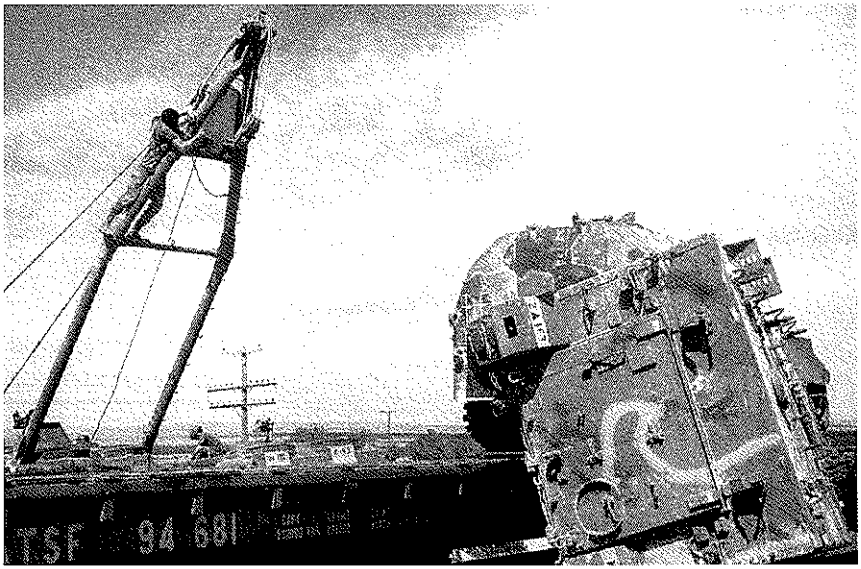
In this photograph taken in 1988, vehicles at the Manix siding await loading on railcars for return to home station.

From its earliest days the National Training Center and the senior level Army personnel responsible for its development and management had been plagued with the question of what equipment should be available at Fort Irwin for the use of visiting units and what should be transported from home station. The original concept had envisioned that all equipment would be issued to units at the NTC to save money and in order that units gain experience in drawing equipment prepositioned in Europe. As detailed in Volume I, that arrangement quickly fell victim to problems with the contract support team responsible for vehicle, weapons, and communication maintenance and the preparation between rotation of vehicles for re-issue. Concurrently, severe cost overruns eventually caused the cancellation of some rotations. In addition, force modernization meant that troops were increasingly forced to train on new equipment with which they had not become familiar at home station or on older generation equipment in those

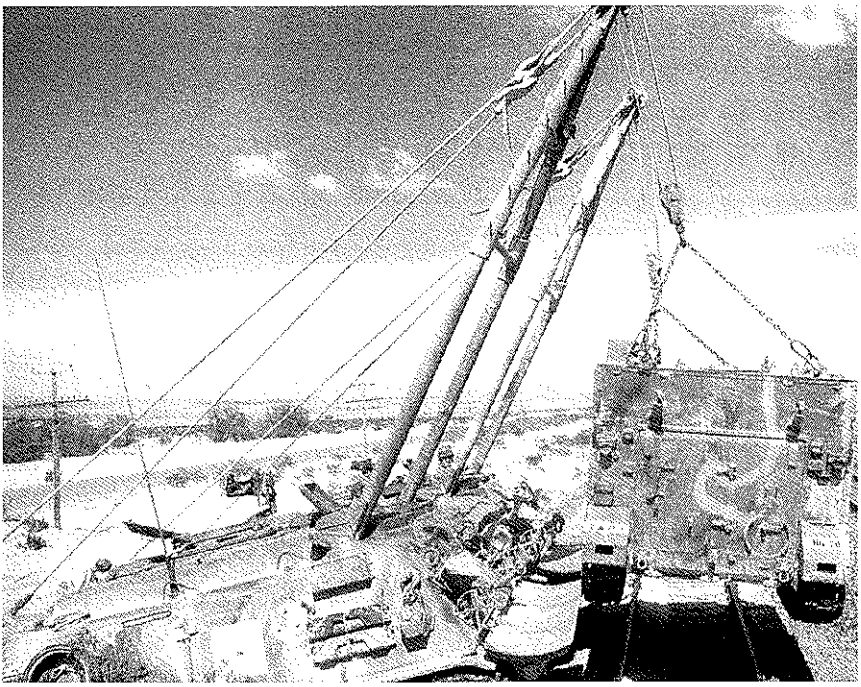


A line of vehicles approaching the Interstate 15 underpass on its way to Manix from Fort Irwin.

instances where the NTC fleet had not kept pace with home station issue. The result of that situation was that units were increasingly required to bring their own vehicles to offset such equipment issue shortfalls. As the situation worsened, the FORSCOM commander directed that after 1 October 1983, the NTC would provide units only with instrumented tracked vehicles normally found in armor and mechanized infantry battalions and stockpiled at Fort Irwin. Subsequently, all units' preparations for deployment to the NTC would include a movement plan for all wheeled and noninstrumented vehicles, and some tracked vehicles, which would be transported by rail. Only tanks (M60A1, M60A3, and M1-series tanks) and



This M577 command post vehicle, a variant of the M113 APC, fell from a railcar while equipment was being loaded at Manix. The mishap blocked the main railroad from Las Vegas to Barstow. M88 medium armored recovery vehicles restored rail traffic



M113 armored personnel carriers would be provided in the contractor-maintained stock for issue to units. In short, units were to bring whatever other equipment was necessary to allow them to go to the field with a full complement of combat equipment.[18]

That action, however, was not to be the end of the prepositioned vehicle question. The issue took on added significance as defense budgets shrank. In addition, the question of prepositioning vehicles in Europe lost much of its significance as the world order changed. The future of heavy forces, especially armored forces, also influenced the debate. As time went on, however, the basic issue increasingly became the cost of transporting equipment from home station to the NTC versus the cost and maintenance of equipment prepositioned there for issue to visiting units.[19] In 1986, NTC commander Horace G. "Pete" Taylor claimed that approximately 1,100 vehicles were transported to the NTC for each rotation. Two studies, conducted respectively in 1987 and 1988 by the Concept Analysis Agency (CAA) and sponsored by the Office of the Department of the Army Office of the Deputy Chief of Staff for Operations and Plans, can serve to demonstrate the dimensions of the problems and the debate surrounding the prepositioned vehicle question. In addition, an account of the Field Artillery Center's struggle to provide equipment for fire support units scheduled for NTC rotations is indicative of the impact of the debate on at least one branch of the Army.

Following the prepositioning of a fleet of M1 Abrams main battle tanks at the NTC in 1986, the CAA conducted a study to assess the cost of prepositioning the follow-on M1A1 Abrams, Bradley Fighting Vehicles, and combat support and combat service support vehicles at the NTC as compared to transporting the same vehicles from home station. The study was based on plans for FY 1988 through FY 1991. A principal finding of the 1987 study was that units designated to use M1A1s in wartime—but who did not possess the modernized equipment at home station—would receive maximum benefit from training with prepositioned equipment. On the other hand, prepositioning M1A1s at the NTC would be more costly

---

18. *NTC* Vol. I, pp. 53-54, 83-84. Despite the FORSCOM directive, a small number of noninstrumented combat support vehicles such as cargo, water, and forklift trucks and refrigerated containers continued to be provided to rotating units. Maj Frank N.Roberts, "Logistics in Desert Operations: Lessons Learned from the National Training Center (MMAS, CGSC, 5 Jun 87, Appendix Three, p. 127. A list of the vehicles and equipment included in the prepositioned fleet in 1991 is in FORSCOM Regulation 350-50, June 1991, Appendix K. Prior to 1988, M2/3 Bradley units brought their vehicles from home station.

19. Approximately 80 percent of total transportation costs for an NTC rotation were for rail transport of vehicles. U.S. Army Concept Analysis Agency, Force Systems Directorate Study Report CAA-SR-88-4, August 1988, subj: Prepositioned Equipment for Rotational Units (PERU) Study, p. 1-1. (SECRET--Info used is UNCLASSIFIED).

than would transportation of the vehicles to the NTC by units already issued the upgraded tanks. With regard to the Bradley M2 and M3 Infantry and Cavalry Fighting Vehicles, accelerating prepositioning, then scheduled for 1991, would be cost effective. Likewise, prepositioning of a mixture of combat support and combat service support vehicles was judged to provide cost savings. Partly as a result of the 1987 CAA study, fielding of the Bradley Fighting Vehicles at the NTC was moved forward from 1991 to October 1988.[20]

The August 1988 CAA study focused on the FY 1990-1997 rotations and was based on the assumption that two complete brigade sets of equipment, one for armor and one for mechanized infantry, each with a combat support and combat service support slice, would be needed as the NTC planned to move to the exercising of full brigades (three actual battalions training simultaneously).[21] The study group examined the requirements for prepositioned equipment to support brigade size rotations, the relative merits of propositioning as opposed to transport to Fort Irwin, and the potential sources of the necessary equipment. The study was based on the assumption that equipment could be acquired from three major sources: U.S. Army Materiel Command depot stocks; the "decrement" of stocks from FORSCOM POMCUS (prepositioning of materiel configured to unit sets) units in Europe; and procurement.[22]

Taking into consideration equipment already available at the NTC for issue to rotating units, the 1988 CAA study considered eight possible solutions to the "PREPO dilemma," based on various combinations of acquisition sources and on possible options. Those options included no transported equipment, the transportation of all equipment, and combinations of transported and prepositioned equipment. Consideration of only a few of the study's conclusions demonstrates the many issues that had to be considered. A complete set of equipment prepositioned at Fort Irwin would eliminate rail costs, produce equipment maintenance costs much lower than recurring rail costs, and reduce maintenance costs for FORSCOM units

---

20. (1) U.S. Army Concepts Analysis Agency, Force Systems Directorate Study Report CAA-SR-87-16, July 1987, subj: "National Training Center Prepositioned Equipment (NTCPE) Study," pp. v-vi. Distributed Unlimited. (2) Staff Semiannual Historical Report, TRADOC Office of the Deputy Chief of Staff for Combat Developments, CY 88/I, pp. II-2,3. (SECRET — Info used is UNCLASSIFIED).

21. The debate over brigade level training at the NTC is examined in Chapter II.

22. (1) Memo, U.S. Army CAA to Deputy Chief of Staff for Operations and Plans, DAMO-TRS, HQDA, 8 Nov 88, subj: Prepositioning Equipment for Rotational Units (PERU) Study. (2) U.S. Army Concept Analysis Agency, Force Systems Directorate Study Report CAA-SR-88-4, "Prepositioned Equipment for Rotation Units (PERU) Study, August 1988, p. v. (SECRET — Info used is UNCLASSIFIED).

after NTC rotations. Negative considerations included enormous procurement expenditures; increases in contractor costs; time-consuming receipt, storage, and issue actions for the Fort Irwin staff; and the rapid wearing out of equipment. In addition, the possible negative impact on the railroad industry could degrade mobilization capability.[23]

What, then, might be the results of transporting all or part of the equipment required for issue at Fort Irwin? Obviously, many of the projected advantages and disadvantages of transporting equipment were the opposite of those for prepositioning. In addition, the study's authors concluded that unit use of their own equipment caused less disruption to the NTC training program by relieving NTC and Fort Irwin personnel of many administrative and maintenance responsibilities. The "transport approach" also provided logistics personnel with experience in the loading and unloading of equipment. On the negative side, the transfer of FORSCOM equipment to the NTC could degrade the command's unit readiness and disrupt unit activities.[24]

After taking all the factors that informed the study into account, the authors concluded that transportation of unit equipment to the NTC by rail was more costly than prepositioning, if and only if, no procurement of vehicles was required. When one-time costs of procurement were compared to projected recurring costs for transport, FY 1990 through FY 1997, procurement appeared to be much more expensive. And procurement would be necessary, because only about 32 percent of the equipment necessary for brigade level operations could be obtained from a combination of existing NTC equipment, equipment from AMC depots, and the decrement of equipment from POMCUS. Therefore, the existing policy of transporting equipment to the NTC would prove the least costly approach to providing two brigade sets of equipment, unless other sources of obtaining the equipment, other than those considered in the study, could be identified.[25]

The question of prepositioning equipment at Fort Irwin versus transporting it from units' home stations, or some combination of the two approaches, continued to be debated over the next two years as the NTC prepared to host "full-up" brigade exercises. In the interim, however, the rules of the game changed as the Cold War ended and the resulting draw down of U.S military forces, made more equipment available, both from

23. CAA Study, August 1988, pp. v.-vi., 1-1 through 1-5. (SECRET — Info used is UNCLASSIFIED).

24. Ibid., p. 1-6.

25. Ibid., pp. v., 1-7 through 1-8.

domestic units and units stationed in Europe. In March 1991, a Combat Training Centers General Officer Executive Committee approved the "NTC 210 percent propositioned equipment concept." By 1992, the NTC had two battalions of prepositioned M1A1 tanks (122 vehicles) plus 10 percent, and two battalions of infantry vehicles plus 10 percent. One of each set of equipment was issued to the unit in training while another set was being prepared for issue to the next unit. The remaining 10 percent was held in a maintenance "float."[26]

The question of the issue of prepositioned versus transported equipment to units training at the NTC affected not only the training center itself, but units scheduled for NTC rotations. The efforts of the U.S. Army Field Artillery Center to deal with the issue of prepositioned fire support equipment at Fort Irwin was a case in point. From the beginning of planning for the NTC, the field artillery sought to support training there and to take advantage of prepositioned equipment to save on transportation costs. However, during the 1980s field artillery shortages consistently defeated efforts to fulfill those plans. The story of the field artillery's efforts to fully participate in NTC training was also indicative of the relationship between the training center and other elements of the Army, as the center evolved and as changes took place within the Army at large.[27]

The concept of prepositioning fire support equipment at the NTC dated back to 1979—even before the NTC opened. At that time, the U.S. Army Field Artillery School proposed that each battalion task force in a training rotation at the NTC be supported by at least one direct support field artillery battalion, minus one firing battery (based at that time on 3 batteries per battalion with 6 guns per battery).[28] Thus, two field artillery battalions (minus one firing battery each) would be required for each rotation. The elimination of one firing battery per battalion reflected the aforementioned shortfalls in equipment and transportation resources.

Two years later, that original plan had to be revised when it became increasingly clear that even greater funding reductions would prohibit full participation by field artillery units in combined arms training at the NTC,

---

26. (1) Briefing Slide, TRADOC Office of the Deputy Chief of Staff for Training to the TRADOC Chief Of Staff, 3 May 91, subj: Combat Training Centers. (2) E-Mail Note, Lt. Col. Ronald Graef to the author, 3 Dec 92, subj: Information on NTC Prepositioned Equipment.

27. This section on the field artillery's efforts to preposition equipment at the NTC is based on the account of that effort in Annual Historical Review, U.S. Army Field Artillery Center and Fort Sill, CY 90, pp. 69-80.

28. In 1983, the field artillery battalion began conversion of its 3 firing batteries from six guns per battery (3X6) to eight guns per battery (3 X 8). A shortage of equipment caused the completion of the conversion to take several years. The NTC table of distribution and allowances (TDA) authorized 24 howitzers.

at least in the near term. The revised plan included prepositioning of one direct support battalion (minus one firing battery) and a general support battalion headquarters element. The direct support battalion would support both rotating battalion task forces and their brigade headquarters during the initial engagement simulation exercise, with the general support battalion headquarters in a reinforcing role. Later in the rotation when the two task forces split to allow one task force to participate in live-fire exercises, the field artillery general support battalion headquarters element would provide direct support to the task force remaining in engagement simulation exercises, while the direct support battalion would support the troops engaged in live-fire exercises.[29] The Field Artillery School made it clear that sacrificing some aspects of field artillery employment would compromise realism and degrade simulated fire support to task forces training at the NTC. All those actions reflected the fact that equipment could ill be spared for prepositioning at the NTC. As a result, many units were not satisfied to train with only two batteries of six guns each of prepositioned fire support equipment. By 1983, much, if not most, of the prepositioned field artillery assets were being ignored by rotating battalion task forces. They preferred—despite the expense and damage to equipment—to bring their own fire support equipment from home station. In 1984, all field artillery equipment prepositioned at the NTC was returned to Fort Sill.

The issue remained relatively dormant until 1987, when the Chief of Field Artillery revived the question of prepositioning fire support equipment at the NTC, by suggesting that 29 M109A2/A3 self-propelled howitzers, 29 M548 ammunition carriers, and 10 M577 command post carriers be issued to the center. He believed that the long-term benefits in training realism and the savings in rail transportation costs would offset the initial cost. With the fire support equipment permanently located at the NTC, the effect of projected budget reductions on the cost of shipping equipment to Fort Irwin would cease to be an issue. The problem of acquiring the howitzers and supporting equipment, however, resurfaced when the commander of the Field Artillery Training Center at Fort Sill complained of possible negative effects on training at Fort Sill, and offered to provide the NTC not 29 but only six howitzers. In May 1987, the Chief of Field Artillery informed the Department of the Army's Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS) that he could ship only nine howitzers from Fort Sill's assets (six from the Field Artillery Training Center and three from the Fort Sill Directorate of Logistics), and proposed that

29. The internal schedule for NTC rotations throughout most of the 1980s was discussed in *NTC* Vol.I, p. 84.

ODCSOPS transfer others from war reserve stocks and maintenance "floats" to meet NTC needs.

In mid-summer 1988, ODCSOPS responded that field artillery equipment would be included in the plans to locate a full maneuver brigade's worth of equipment at the NTC.[30] The shortages of equipment, however, remained a problem, one that was complicated by the ongoing 3 X 8 conversion (expanding batteries from 6 to 8 howitzers and battalions from 18 to 24 howitzers). In addition, the M577 command post carriers were in very short supply. The conversion of 9th Infantry Division elements to specialized and heavy units, changes in the Army's force structure in Europe, and the Howitzer Improvement Program further hampered the prepositioning of fire support equipment. As a result, the fielding schedule for field artillery equipment at the NTC (with the exception of the original nine howitzers) was moved to FY 1992 when the full maneuver brigade's worth of equipment was scheduled for fielding.

By early 1989, however, budget and manpower reductions had, in turn, reduced Fort Sill's training needs. Consequently, more howitzers from Fort Sill could be made available for issue to the NTC. Other available howitzers were identified from throughout the Army, thereby making a total of twenty-eight M109A2/A3s available. Twenty-eight M548 ammunition carriers came from U.S. Army Europe depot stocks. The Department of the Army instructed that all redistribution be completed by the spring of 1989. Prepositioning a full complement of fire support equipment at the NTC took longer than the target date, however, when many of the howitzers arrived at the NTC badly in need of maintenance, and the NTC lacked the resources to provide maintenance contracts for some of the equipment when it began arriving. As a result, the only rotation in 1989 to feature prepositioned field artillery equipment was that of the 1st Cavalry Division. Meanwhile, rapidly changing political events in Europe and the Soviet Union led to reductions in the force structure, in accordance with Congressionally-mandated military budget and program reductions. The table of organization and equipment (TO&E) force reductions freed up more than enough surplus fire support equipment for full prepositioning at the NTC by the summer of 1990.

Thus, the field artillery's seven-year struggle to offset rail transportation costs and to fully participate in combined arms training exercises at the NTC by prepositioning equipment there, came to an end. In the last analysis, that success was not a result of the NTC concept or of the Army's

30. See the discussion of the CAA study of 1988 above.

dedication to the principle of prepositioned equipment, but to the freed-up availability of previously committed equipment. As noted above, the same shortages of other equipment such as M1-series tanks also came to an end with the end of the Cold War.

Instrumentation Initialization

One of the most important and essential activities troops experienced during the days spent at Fort Irwin before deployment to the field was the initialization of the instrumentation equipment which would be employed by mounted and dismounted troops alike during force-on-force tactical engagement exercises. All instrumented vehicles, whether prepositioned at the NTC or brought from home station, had to be prepared to interface with the instrumentation system which was the heart of the training experience at the NTC. The instrumentation system was central to the monitoring and control of maneuver exercises, and the collection and integration of battle data at the TRADOC Operations Center located in the heart of Fort Irwin. It also provided the basis for the after action reviews (AAR) that were, arguably, the NTC's greatest contribution to improvements in Army training during the 1980s and the early 1990s. The data collected during NTC exercises also provided a resource for subsequent research and analysis of Army doctrine, organization, materiel development, and leader development.[31]

The initialization procedures that allowed the capture and savings of unit tactical performance data was essential to the NTC concept and the NTC experience. The following account of that process was based on the status of the system in 1985.[32] While details changed as the instrumentation

---

31. A detailed description of the early instrumentation system is in Chapman, *NTC*, Vol. I, pp. 63-71. The organization and operation of the NTC Operations Center was discussed in that volume, pp. 90-98.

Despite the obvious importance of the process that linked players in the field with the sophisticated computer system that recorded their activities, the initialization process has been largely ignored by students of the NTC training system. That relative lack of interest has, without doubt, been the result of the focus on the much more visible and exciting activities that took place after units departed Fort Irwin headquarters for the maneuver areas.

32. This account of the initialization system is based in part on T. J. Ritenour, "A Detailed Description of the National Training Center Instrumentation System Initialization Procedure," (BDM Corp. for ARI Field Unit at Presidio of Monterey, California Training Research Laboratory, January 1987). Ridenour's report, which was based on numerous interviews with NTC personnel, was the first in a series of reports and products prepared by ARI for the NTC, under the sponsorship of the Combined Arms Training Activity (CATA), U. S. Army Combined Arms Center, Fort Leavenworth, Kan. The relationship between ARI, CATA, and the NTC is discussed in Chapter VIII. Other information is based on the author's observations during an on-site visit and on informal interviews with NTC personnel and veterans of NTC rotations.

system was upgraded and as one contractor replaced another, the basic essentials and principles of the system generally remained the same.

The events that collectively accomplished initialization of the instrumentation system for vehicles and other "players"[33] actually began approximately thirty days before a rotation was scheduled, when the commander of Fort Irwin and the Fort Irwin base operations support team established the number of instrumented tracked vehicles that would be available for issue. The commander of the next rotational brigade was then notified of the number, by type, of vehicles he could expect to receive during NTC in-processing. Three weeks later, the unit scheduled for rotation provided the NTC Operations Group with a formal brigade task force organization for the NTC training period, from which the Operations Group prepared—for planning purposes—an initial player list.[34] Using that list, Operations Center personnel developed a plan for allocation and distribution of the "Micro-B" units (for vehicles) and "Manpacks" (man-portable units for individual unit personnel) that would provide communication with the computers in the Operations Center.[35]

Three days before units moved to the field for their first mission against the NTC OPFOR, vehicles to be instrumented were issued to the player units at a designated marshalling area in the aforementioned "Dust Bowl" (Map 5). Part of the vehicle draw process included technical inspection of all vehicle, weapons, and communications systems by Boeing International, the Fort Irwin base operations support team at that time.[36] Systems found to have serious mechanical or other difficulties were expected to be rejected by the unit. Thus, during the two-day equipment draw, the final number of operational (and ultimately instrumented) vehicles to be involved in training remained uncertain. Next, MILES hardware (laser sensors) and Micro-B units were installed. Vehicles brought from home station were similarly equipped. The initialization procedure identified each unit according to task force, company, platoon, a "graphics identifier," player

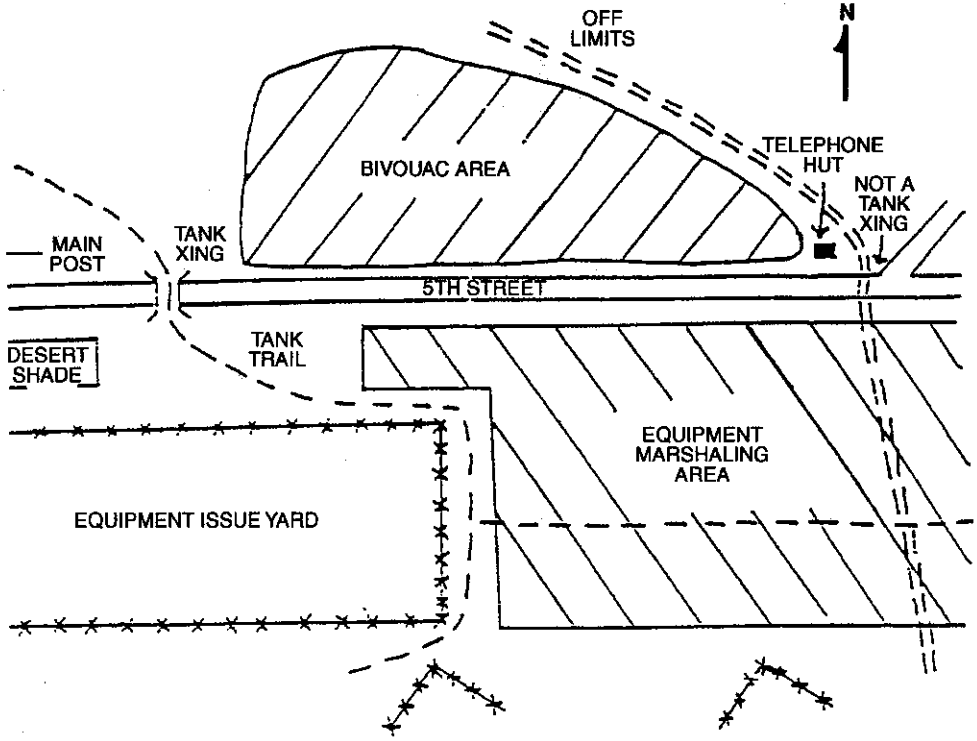
33. The term "player" is used for the purposes of this study, as it was at the NTC, to refer to any instrumented element: vehicles, dismounted infantry, artillery, and aviation. During the period covered in this discussion, neither artillery nor aviation were instrumented.

34. According to FORSCOM Regulation 350-50, June 1991 (p. 5), by that time, a projected availability list of prepositioned vehicles was supplied by the NTC to the brigade commander of the rotating units, 120 days prior to their arrival at Fort Irwin. A final list was drawn up 60 days prior to the rotation.

35. Ridenour, p. 4, 7. FORSCOM Regulation 350-85-10 directed that NTC training task organizations be balanced and fixed for the training period.

36. In 1986, Boeing International was replaced by DynCorp, as noted above.

Map 5
"Dust Bowl" Area - Fort Irwin



Source: NTC Support Letter of Instruction, 20 Jan 84.

type, and the Micro-B unit identification (serial) number.[37] BLUFOR vehicles accepted by the unit and cleared for departure by draw yard personnel had fifteen minutes to leave the draw yard and proceed to the Integrated Instrumentation Checkpoint (so-called because both prepositioned and transported vehicles were serviced there).[38] The "fifteen-minute" requirement was a reaction to the massive traffic jams that usually occurred, and which in 115 degree heat caused tempers to rise rapidly.

The Integrated Instrumentation Checkpoint was located at a facility termed "Desert Shade," which was, in reality, a sort of oversized picnic shelter—located in the middle of a bare and very dusty field—that provided shade for the checkout and initialization crews (Map 6). The remaining two days before rotating units departed Fort Irwin for the field were dedicated to completion of the initialization process, a task supervised by the infantry and armor observer/controller teams. The NTC contractor teams responsible for various components of the system determined that the vehicle and personnel instrumentation equipment was operating properly. In 1985, that meant LORAL was responsible for the MILES laser training devices and General Dynamics Electronics for the Micro-B units. Finally, Science Applications, Inc. and training and analysis personnel located at the Operations Center assured that the Core Instrumentation Subsystem was functioning properly.[39]

Observer/controllers began the checkout process by recording the following information on a log sheet: vehicle type; contractor bumper number; Micro-B unit identification number; and unit bumper number. Next the Micro-B unit was activated and an "event registration" checkout begun through radio contact between the checkout point at Desert Shade and officials at the instrumentation center. Controllers and Operations Center personnel confirmed the "pick up" of position location and radio signals from the instrumented players, as well as "near miss" and "kill" signals of the MILES system and the signals used by O/Cs to "resurrect" killed vehicles. Controllers confirmed that signals to the field that vehicles had been "killed"

---

37. The graphics identifier was a symbol that stood for a particular type of player. For example, an M113 armored personnel carrier would appear on the computer screen as a small black diamond (see NTC Vol. I, p. 94. "Player type" referred to the type of vehicle (M60, TOW, dismounted, etc.).

38. Opposing Force (OPFOR) vehicles were initialized through direct coordination between the Operations Center instrumentation personnel and training analysts, and the instrumentation contract team. The OPFOR vehicles used a checkpoint adjacent to the OPFOR motorpool. Ridenour, pp. 5, 7.

39. As this study goes to press, LORAL continued as the contractor for the MILES, although, as discussed below, MILES development had become a part of a larger instrumentation effort. The instrumentation interface with maneuver units was, by 1993, exercised under contract with Martin Marietta Corp. instead of Science Applications International Corp.

or "resurrected," from the training analysts located at the Operations Center, could be received.[40]

The MILES systems for dismounted soldiers, which fit over the helmet and web gear of the user and as aforementioned, were referred to as "Manpacks," were issued by General Dynamics Service Company to headquarters and headquarters companies of designated battalions in the Boeing Services International issue area. The man-portable systems were then hand receipted to the users. As with vehicles, manpacks were subjected to a system check. Manpacks assigned to vehicle personnel were required to go through the checkpoint with that vehicle. Should an instrumented weapon be dismounted or transferred to another vehicle, the MILES equipment remained with the vehicle or weapon. Batteries, each of which were designed to operate the manpack systems for twenty-four hours, were similarly issued.[41]

The last actions necessary to complete the initialization procedure were the preparation of a final master list of all instrumented players and its transfer into the instrumentation system. At the end of each day of checkout activity, the log sheets containing identification information on each player were delivered to the Operations Center and used with the unit and player list developed from the previously submitted brigade task force organization list to prepare a first draft of the "tracking" list. That list ultimately would permit the flow of information to and from the field, information that allowed the realism in training that lay at the heart of the NTC concept. Then, working vehicle by vehicle, the S-3 observer/controller in the field physically checked bumper numbers, Boeing's vehicle numbers, and Micro-B serial numbers, while the figures were verified by the senior training analyst at the Operations Center. After any necessary corrections were made, a final version of the tracking list was prepared and installed on the Operations Center computers. Thus, checked and double-checked, the instrumentation system was initialized and ready for maneuvers in the field. During any rotation, vehicles invariably broke down, Micro-B units failed, or MILES malfunctioned. The tracking list in the NTC computers was constantly updated to accurately reflect the players actually engaged in the maneuver exercises.[42]

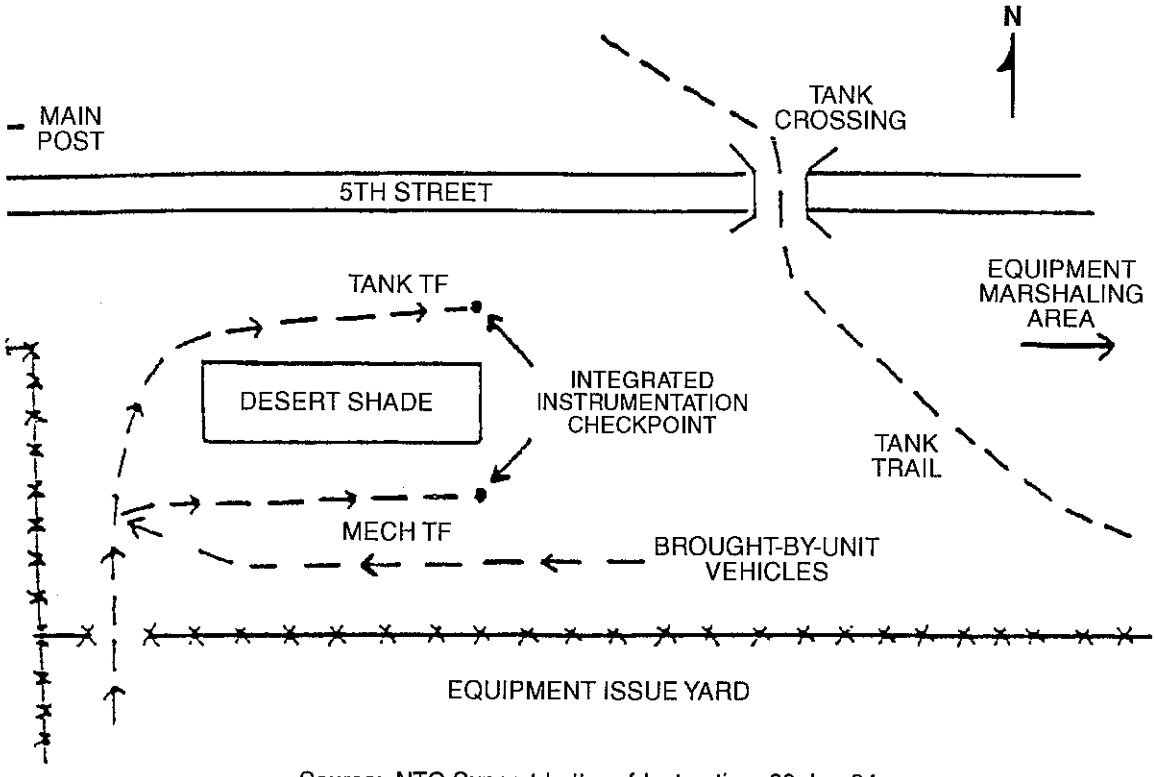
---

40. Ridenour, pp. 9-10.

41. DA Form 2496, ATXY-TAF, Chief, Operations Group to distr, 30 Apr 85, subj: Manpack Distribution.

42. Ritenour, pp. 11-12.

Map 6
Integrated Instrumentation Checkpoint - "Desert Shade"



Source: NTC Support Letter of Instruction, 20 Jan 84.

The initialization of the instrumentation system was only one example of the many activities that had to take place behind the scenes to make possible the unique training provided to U.S. Army units at the NTC. It was also indicative of the coordination necessary between the leaders of rotating FORSCOM units, the TRADOC training analysis community, other Fort Irwin permanent party personnel, and contractor representatives, to assure that maximum benefits were realized by training units and the Army at large.